

WHAT IS CLAIMED IS:

1. An axle supporting structure for industrial vehicles, comprising:

an axle supporting wheels, the axle being supported free to swing in its center part relative to the vehicle frame and free to displace in the left and right directions,

a first link, one end of the first link being connected to the axle so that it is free to displace in the left and right directions of the vehicle, the other end being connected to the vehicle frame so that it is free to displace in the left and right directions of the vehicle, and the link being inclined,

a second link, one end of the second link being connected to the vicinity of the middle point of the first link, the other end being connected to one of the axle and vehicle frame, and the link being inclined, and

a third link, one end of the third link being connected to the other end of the first link, its other end being connected to one of the vehicle frame and the axle, and the link being disposed substantially parallel to the axle, wherein:

the inclination angle of the first link varies according to the relative positions of the axle and vehicle frame to the left and right of the vehicle, and the vehicle posture is thereby controlled.

2. An axle supporting structure for industrial vehicles as defined in Claim 1, wherein a swing axis which extends in the front/rear direction of the vehicle is provided on the axle, and this swing axis is inserted into a slot extending in the left and right direction of the vehicle body provided in the vehicle frame.

3. An axle supporting structure for industrial vehicles as defined in Claim 1,

wherein the other end of the second link connected to the first link is connected to the axle, the other end of the third link connected to the first link is connected to the vehicle frame, and the swing center of the axle is disposed lower than the connecting sites of the first link and second link to the axle.

4. An axle supporting structure for industrial vehicles as defined in Claim 1, wherein the second link or third link extends and contracts in the axial direction.

5. An axle supporting structure for industrial vehicles as defined in Claim 1, wherein the second link or third link comprises a damper mechanism which restricts the extension and contraction.

6. An axle supporting structure for industrial vehicles as defined in Claim 1, wherein a connecting part between the upper end of the first link and the vehicle frame or connecting part between the lower end and the axle is connected via an elastic member which permits displacement in the left and right directions.

7. An axle supporting structure for industrial vehicles as defined in Claim 1, wherein a connecting part between the upper end of the first link and the vehicle frame or a connecting part between the lower end of the first link and the axle is connected to the vehicle frame or the axle via a vertical link provided free to swing on the axle or the vehicle frame.

8. An axle supporting structure for industrial vehicles as defined in Claim 1, wherein the other end of the second link connected to the first link, is connected to the vehicle frame, and the other end of the third link connected to the first link, is connected to a supporting member formed in one piece with the axle.

9. An axle supporting structure for industrial vehicles, comprising:

an axle supporting wheels, the axle being supported free to swing in its middle part relative to the vehicle frame, and free to displace in the left and right directions,

a detecting member, this detecting member detecting the relative displacement of the vehicle frame and axle in the left and right directions, and

a working member, the working member being connected to the axle and the vehicle frame, and supplying a force which tilts the vehicle frame according to the action of the detecting member, wherein:

the working member displaces via the detecting member according to the relative displacement of the axle and the vehicle frame in the left and right directions of the vehicle, and the posture of the vehicle is thereby controlled.

10. An axle supporting structure for industrial vehicles as defined in Claim 9, wherein:

the working member is a bell crank disposed free to swing on the axle or vehicle frame, the crank connecting the vehicle frame or axle and a horizontal arm by a vertical link, and

the detecting member is a horizontal link which connects the vertical arm

of the of bell crank, and the vehicle frame or axle.

11. An axle supporting structure for industrial vehicles, comprising:

an axle supporting wheels, the axle being supported free to swing in its center part relative to the vehicle frame and free to displace in the left and right directions,

a guide member, the guide member being disposed in one of the axle and vehicle frame, and comprising a pair of guide surfaces incline so as to approach the other of these with increasing distance from the center of the vehicle, and

a pair of the elastic members, the elastic members being disposed in one of the vehicle frame and axle, and sliding on the pair of guide surfaces, wherein:

the elastic members displace along the guide surfaces according to the relative displacement of the axle and vehicle frame to the left and right directions of the vehicle, and thereby control the posture of the vehicle.

12. An axle supporting structure for industrial vehicles as defined in Claim 1, wherein the axle is connected to the vehicle frame by a pair of front and rear links extending in the front and rear direction of the vehicle in the same horizontal plane.

13. An axle supporting structure for industrial vehicles as defined in Claim 12, wherein the pair of front and rear links are mutually parallel.

14. An axle supporting structure for industrial vehicles as defined in Claim 12, wherein, in the pair of front and rear links, the interval between the connecting points to the vehicle frame is different from the interval between the connecting points to the axle.

15. An axle supporting structure for industrial vehicles, comprising:

an axle supporting wheels,

a vehicle frame, and

a pair of links which connect the axle and the vehicle frame, these links being disposed symmetrically about the center of the vehicle and inclining symmetrically with respect to each other, wherein:

the pair of links incline differently according to the relative displacement of the axle and vehicle frame in the left and right direction of the vehicle, and the posture of the vehicle is thereby controlled.